REMARKS

Entry of the above amendments and reconsideration of this application are requested. Upon entry of the amendments this application will contain claims 1, 3-7, 11-12, 20, 26-28, 49-53, and 56-66 pending and under consideration. Claim 1 has been amended to incorporate the limitation of a carbodiimide crosslinking agent from claim 2. Other compositional features have been added to claim 1 and claim 49. Support for such other features is found throughout the application including for example at page 7, first paragraph, page 8, lines 2-7, page 10. lines 13-19, and page 10, lines 8-10. Claim 53 has been amended to add the feature that the "composition exhibits a capacity to maintain its shape when hydrated and regain its height following compression when hydrated". Support for this amendment is found at page 7, lines 1-6. Other amendments to the claims are formal in nature and are made to correct dependencies and language due to other cancellations or amendments, or to add new claims incorporating previously-claimed features. The amendments thus introduce no new subject matter into the application.

Turning now to specific matters raised in the Office Action, at page 3 certain rejections based upon new matter principles were made to claims 1, 49 and 58. First, the Action stated that the introduction of the phrase "said collagen protein from a source other than the demineralized protein" in these claims introduced new matter. This phrase has been deleted from the claims without admission or prejudice. The applicants remain convinced that one skilled in the art reading the application as filed would understand that this was an embodiment described in the specification. Second, the Action stated that "a sterile" as added to claim 58 introduced new matter, absent applicants pointing out support for the term in the specification. In response, the Examiner's attention is directed to page 13, lines 1-2 and 21-22, the sentence spanning pages 14 and 15, and page 15, lines 19-20. It is also noted that the compositions are described as being medically implantable and one skilled in the art would understand the need for their sterility at that point in time. Third, the Action stated that "an aqueous" in claim 58 introduces new subject matter, in the absence of applicants' pointing to support in the specification. In response, the Examiner's attention is directed to page 7, lines 18-21 where "saline or

another diluent" are taught, from which one of ordinary skill in the art would readily understand the teaching of aqueous diluents as suitable for inventive compositions.

In view of the foregoing, withdrawal of the rejections based upon new matter principles is solicited.

Claims 1 and 64 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement for use of the term "plasticizer". Claim 1 has been amended to remove this term, and thus this rejection is rendered moot as to claim 1. Dependent claim 64 and new dependent claims 65-66 recite a plasticizer as a part of the composition. It is submitted that these claims comply with the written description requirement for the following reasons.

On the subject of proper written description rejections, MPEP 2163 states that the primary guidepost is whether the specification demonstrates that the applicant was in possession of the claimed invention, and that in order to make a proper rejection, the Examiner must:

> "(A) Identify the claim limitation at issue; and
> (B) Establish a prima facie case by providing reasons why a person skilled in the art at the time the application was filed would not have recognized that the inventor was in possession of the invention as claimed in view of the disclosure of the application as filed. A general allegation of "unpredictability in the art" is not a sufficient reason to support a rejection for lack of adequate written description."

Further, MPEP 2163 states that the "written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice (see i)(A), above), reduction to drawings (see i)(B), above), or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties..." and that "[w]hat is conventional or well known to one of ordinary skill in the art need not be disclosed in detail. See Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d at 1384, 231 USPQ at 94. See also Capon v. Eshhar, 418 F.3d 1349, 1357, 76 USPQ2d 1078, 1085 (Fed. Cir. 2005)("The 'written description' requirement must be applied in the context of the particular invention and the state of the knowledge. As each field evolves, the balance also evolves between what is known and what is added by each inventive contribution."). If a skilled artisan would have understood the inventor to be in possession of the claimed invention at the time of

filing, even if every nuance of the claims is not explicitly described in the specification, then the adequate description requirement is met. See, e.g., Vas-Cath, 935 F.2d at 1563, 19 USPQ2d at 1116; Martin v. Johnson, 454 F.2d 746, 751, 172 USPQ 391, 395 (CCPA 1972) (stating "the description need not be in ipsis verbis [i.e., "in the same words"] to be sufficient")."

In the present case, claims 64-66 add to the claimed compositions a requirement for the presence of a plasticizer. As noted by the Examiner in the Action, the function of such an ingredient is well known to those skilled in the relevant art, and in fact many examples come immediately to mind. The Examiner has not set forth in the Office Action any reason as to why the specification does not demonstrate that the applicants were in possession of the invention claimed in claims 64-66, or any reason why there would be a difficulty or lack of predictability for one skilled in the art to utilize plasticizers in the claimed combinations.

In view of the above, it is submitted that claims 64-66 are adequately described in the specification and that the maintenance or application of a written description rejection as to these claims would be in error. Withdrawal of this rejection is therefore solicited.

The Office Action rejected claim 58 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, for its recitation of "an aqueous diluent". The Office Action states that an example should be specifically provide. In response, the Examiner's attention is directed to page 7, lines 18-21, wherein saline is provided as an example. Withdrawal of this rejection is thus requested.

Claims 1-17, 19-23, 26-28, 31, and 49-57 stand rejected under 35 USC 103(a) as being unpatentable over Sybert et al. (US 2002/0107570 A1) in view of Boyce et al. (US 2001/0043940 A1). Certain of these claims have been cancelled, rendering this rejection moot as to those cancelled claims. Further, it is submitted that the maintenance of this rejection as to any of the remaining claims in this group would be in error for the following reasons.

Independent claim 1 and its dependent claims, as claim 1 is amended, require "a porous or semi-porous implant material comprising a collagen scaffolding having particles of demineralized bone matrix (DBM) dispersed within the collagen scaffolding,

said implant material having been subjected to crosslinking with a carbodiimide crosslinking agent under conditions that crosslink the porous or semi-porous implant material but retain an osteoinductive capacity of the DBM, so as to provide an implant material exhibiting a combination of osteoconductive and osteoinductive properties." Independent claim 49 and its dependent claims require a composition that comprises "demineralized bone matrix (DBM) and a porous or semi-porous collagen sponge material, said DBM in the form of DBM particles dispersed within the collagen sponge material, and wherein the composition is cross-linked via an amide linkage." Compositions as claimed are exemplified in the specific working Examples of the application. These working examples demonstrate that the use of a carbodiimide crosslinking agent (which introduces amide linkages) provides particularly beneficial collagen/DBM compositions as claimed, which possess the ability to generate bone-forming activities despite having been subjected to the crosslinking treatment.

Specifically, the Examiner's attention is directed to the evidentiary Experimental section beginning at page 12 of the specification. Therein, the preparation and crosslinking of several collagen/DBM sponge compositions with a carbodiimide crosslinker, and the testing of those compositions for their activity when implanted in vivo into intramuscular pouches of athymic rats is described. Results are also described in the Experimental and are illustrated in Figs. 2-7 of the application. Beneficial biological activities were noted in the sponge materials, including the presence of new bone (see e.g. Fig. 2 and description thereof in the middle of page 13 and Fig. 7 and description thereof near the top of page 16) or related cellular activity at or blood vessel development within DBM particles (see Figs. 3-6 and descriptions thereof at pages 14 and 15.)

It is known and expected in the art that crosslinking of DBM and collagen can deleteriously affect biological responses to the materials when implanted. In the present application, it is demonstrated that the carbodiimide crosslinkers and amide crosslinks can effectively be used to improve the physical properties of collagen/DBM implant compositions while leaving beneficial biological properties of the ingredients remaining.

Neither Sybert et al. nor Boyce et al., nor their combination, teaches or suggests compositions as claimed, or that compositions as claimed would possess the particularly

beneficial properties as exemplified in the present application. Accordingly, it is submitted that maintenance of the above-identified rejection as to any claim presently pending would be in error.

The rejections of claims 18, 30, 23, 24 and 25 are rendered moot by the cancellation of these claims above.

Claims 58-64 stand rejected under 35 USC 103(a) as being unpatentable over Sybert et al. in view of Boyce et al. (US 2002/0107570) and taken further in view of McKay (US 6,261,586 B1). To the extent maintained against these claims as amended, this rejection is traversed.

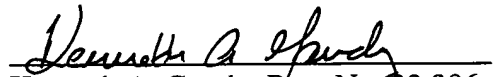
In the Office Action, this rejection is supported by the assertion that it would be obvious to "improve upon" the design of Sybert et al. be reformatting the Sybert et al. products into a paste form. It is submitted that no such alteration in the design of the Sybert et al. device could possibly be motivated by the references because the Sybert et al. device is specifically designed to be "sufficiently flexible to allow affixation to a vertebral site yet sufficiently strong, tough and inextensile to withstand applied excessive force". See Sybert et al. paragraph [22]. To make the change suggested in the Office Action would destroy the function of the Sybert et al. device. It is well established that modifications or combinations of references that would destroy the function of the primary reference are not proper in making a rejection under 35 USC 103. Further, in this rejection, the Office Action relies upon McKay for its teaching of e-beam and gamma radiation sterilization processes, and asserts that it would have been obvious to one of ordinary skill to apply such processes to the paste-consistency product of Boyce et al. taught in paragraph [67]. However, it is noted that this product of Boyce et al. is an intermediate product in the preparation of the final, solid-form implant of Boyce et al. There is no explanation in the Office Action as to why one skilled in the art would be motivated to sterilize this intermediate product, when the final solid product will need to be terminally sterilized as well.

In view of the foregoing, withdrawal of the rejection of claims 58-64 under 35 USC 103(a) is requested.

In view of the foregoing amendments and remarks, reconsideration and allowance of this application containing claims 1, 3-7, 11-12, 20, 26-28, 49-53, and 56-66 are

solicited. The Examiner is invited to telephone the undersigned attorney if there are any questions about this submission or other matters that can be handled in that fashion to expedite the allowance of the present application.

Respectfully submitted,

By: 

Kenneth A. Gandy, Reg. No. 33,386
Woodard, Emhardt, Moriarty,
McNett & Henry LLP
111 Monument Circle, Suite 3700
Indianapolis, Indiana 46204-5137
(317) 634-3456